

Larvicides & Adulticides Fact Sheet



Miami-Dade County's larval mosquito control

Inspectors with the Miami Dade County Mosquito Control and Habitat Management Division conduct daily inspections to find mosquito larvae and take the necessary action to eliminate mosquitoes while in their larval developmental stage. Small containers are emptied, while larger areas may require the use of an insecticide. This process keeps larvae from becoming flying, biting mosquitoes.

What are insecticides?

Insecticides are substances used to kill insects. Miami Dade County uses both larvicide and adulticide insecticides registered for use in the United States by the United States Environmental Protection Agency (EPA) to aid in mosquito control.

- Larvicides eliminate immature mosquitoes before they can become adults. They can either be biological, such as proteins from a specific bacteria that are lethal to mosquito larvae but not to other organisms, or chemical, such as insect growth regulators, surface films, or organophosphates. Larvicides can help reduce the overall mosquito population by limiting the number of new adult mosquitoes produced.
- Adulticides are applied from hand-held sprayers, truck-mounted sprayers or aircraft to eliminate adult mosquitoes. Adulticides have an immediate impact, reducing the number of mosquitoes that can bite people and possibly transmit the Zika virus and other diseases.

Specific insecticides used

- *Bacillus thuringiensis israelensis (Bti)* is applied in either liquid or granular form to areas of standing water with mosquito breeding. Bti is a naturally occurring soil bacterium. The bacterium produces proteins in a crystalline form. When the mosquito larvae eat these crystals, the proteins attack their digestive system, eliminating the larvae. Bti is quickly biodegraded and leaves no residue.
- *Bacillus sphaericus (Bs)* is a common soil-inhabiting bacterium applied in either liquid or granular form to areas of standing water with mosquito breeding. The bacterium produces a protein toxin that may be used to control mosquito larvae. Bs is nontoxic to non-target organisms.
- *Methoprene (Altosid)* is an insect-growth regulator that is applied in liquid, granules, pellets, or briquets to areas of standing water with mosquito breeding. This material prevents mosquito larvae from emerging as viable adult mosquitoes.
- *Gambusia* is a species of mosquito-eating fish. These fish are used to stock unmaintained pools and will reproduce and eat mosquito larvae continuously.





Adult mosquito control

The following insecticides are currently used in the County's adult mosquito control program:

- *Duet (Prallethrin 1% + Sumithrin 5%)* is the only insecticide used in handheld sprayers. It is also used in backpack and truck-mounted sprayers.
- *Biomist 30+30 (Permethrin 30%)* is used in backpack and truck-mounted sprayers.
- *DeltAGard (Deltamethrin 2%)* is also used in backpack and truck-mounted sprayers.
- *Zenivex (Etofenprox 4%)* is used in backpack and truck-mounted sprayers.

According to the EPA, these insecticides can be used for public health mosquito control programs without posing unreasonable risks to human health, wildlife or the environment.



Aerial mosquito control

Aerial spraying for the control of nuisance mosquitoes is used in Miami-Dade County when mosquito trap counts exceed acceptable levels and when there is an increased number of complaint calls from residents reporting mosquitoes as a nuisance.

According to the U.S. Centers for Disease Control, aerial spraying using the pesticide naled is a safe, quick and efficient method for mosquito control. Naled is an EPA-registered pesticide which has been used for aerial spraying by Miami-Dade County for more than forty years. It is an oil-based organic phosphate insecticide used solely for aerial application. Mosquito control programs throughout the United States and in neighboring counties and districts in Florida also use naled as part of their integrated vector control programs.

Miami-Dade County used aerial spraying during the 2016 response to local transmission of Zika to help control the *Aedes aegypti* mosquito population in Miami Beach and the Wynwood area north of downtown Miami. Aerial treatments using naled, in conjunction with aerial and truck Bti larvicide treatments, allowed Mosquito Control to successfully break the cycle of local Zika transmission.



Are insecticides harmful to people?

Effect on human health is one of the primary factors considered in regulation of insecticides. Insecticides used in mosquito control have been determined by the EPA not to pose an unreasonable risk to human health.

Although it is not necessary, people who are concerned about exposure to insecticides, such as those with chemical sensitivity or breathing conditions such as asthma, can reduce their potential for exposure by staying indoors during the application period. When an area within the County is scheduled for aerial spraying, designated communities are notified before aerial spraying begins.

Of special note is that the insecticides used by Miami-Dade County to control mosquitoes are non-persistent, meaning they do not have a residual or lasting effect. They last only a short period of time, and they quickly biodegrade into harmless byproducts.